

Remarks/Arguments:

Claims 1-22 are pending. Claims 1-22 stand rejected.

Section 112 Rejections:

As requested, applicants have now deleted the phrase "interaction with the sample". As a result, claims 1, 7, 10, 12, 15, 19, 21 and 22 have been amended by substituting the phrase "scattered/reflected from the sample".

Section 103 Rejections:

Claims 1-22 have been rejected as being obvious in view of Horiuchi and Brand. Applicants respectfully submit that this rejection is overcome for the reasons set forth below.

Amended claim 1 now includes features which are not suggested by the cited references, namely:

- a second modulator configured to modulate the second optical radiation **at a second frequency not harmonically related to and different from the first frequency** to generate second modulated optical radiation;
- a first detector configured to detect the first and second modulated optical radiation **scattered/reflected from the sample** and generate a first detection signal;

Basis for the radiation scattered and/or reflected from the sample may be found in the specification, for example, at page 9, paragraph 33. As described, the sample may include a volume of the atmosphere which may or may not have a scattering background. The sample may also include a solid surface, vegetation, etc., which may include absorption, or reflection features.

Basis for the second frequency being different from the first frequency and being not harmonically related to the first frequency may be found in the specification, for example, at page 8, paragraph 29. As described, **the second modulation frequency f2** imparted by the second modulator **may be different from and perhaps also not a harmonic of the first modulation frequency f1** imparted by the first modulator. As also described at page 8, paragraph 30, values of the first modulation frequency f1 and the second modulation frequency f2 may be selected to reduce mutual interference or inter-modulation.

Horiuchi discloses a system for measuring ground delay characteristics of an optical fiber line. As disclosed at column 1, lines 30-42, the group delay of an optical fiber line is measured by inputting a signal at one end of the optical fiber and measuring the signal at the other end of the optical fiber. As also shown in FIG. 1, a first wavelength is output by reference light source 22 (λ_r) and amplitude modulated by modulator 28. Similarly, wavelength light source 28 outputs a variable wavelength (λ_s) and is amplitude modulated by modulator 34. Modulator 28 provides an amplitude modulation at frequency f_r and modulator 34 provides an amplitude modulation at frequency f_s . The frequency f_r and the frequency f_s are related to each other by **being harmonic multiples of each other** (column 4, lines 8-11). As also disclosed in FIG. 1,

at the receiving end, a synchronous detector (46) is used to separate the **two harmonically related frequencies (f_s and f_r)**.

Horiuchi requires that frequency f_s be derived by multiplying the reference frequency of f_r by N. Horiuchi further requires that f_r and f_s be synchronous to each other.

Horiuchi, however, does **not** disclose that **the first and second frequencies are not harmonically related to each other, and are different from each other**.

Furthermore, Horiuchi discloses transmitting radiation through an optical line (12 in FIG. 1) where radiation is transmitted into one end of the fiber and transmitted out of the other end of the fiber. Horiuchi does **not** disclose **remotely sensing a material in a sample (as stated in the preamble), where the first and second radiation is scattered or reflected from the sample**.

Favorable reconsideration is requested for amended claim 1.

Although not the same, independent claims 7, 12, 19 and 21 have been amended to recite features similar to the features of amended claim 1. These independent claims are, therefore, not subject to rejection in view of the cited references for the same reasons set forth for amended claim 1.

Dependent claims 2-6 depend from amended claim 1, claims 8-11 depend from claim 7, claims 13-18 depend from amended claim 12, claim 20 depends from amended claim 19, and claim 22 depends from amended claim 21. These dependent claims are, therefore, not subject to rejection in view of the cited references for at least the same reasons set forth for amended claim 1. Favorable reconsideration is respectfully requested.

Double Patenting:

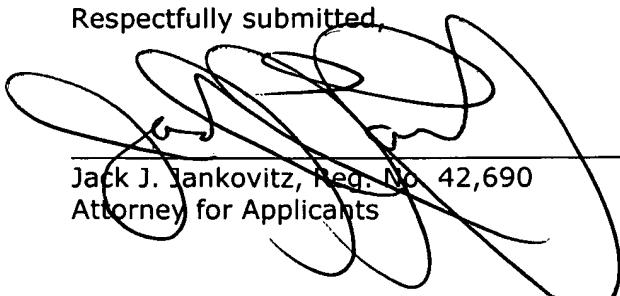
Claims 1-22 have been provisionally rejected under the doctrine of obviousness-type double patenting as being obvious in view of co-pending application number 10/419,797 and in view of Horiuchi. The Office Action states that a timely filed terminal disclaimer may be used to overcome this provisional rejection.

In order to permit this application to pass to issue, applicants are enclosing a terminal disclaimer, as requested.

Conclusion

This application is now in condition for allowance and may pass to issue.

Respectfully submitted,


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Enclosure: Terminal Disclaimer

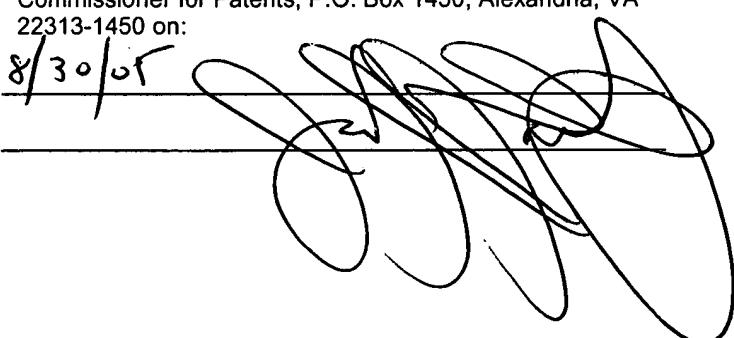
Dated: August 30, 2005

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